I ſuppoſe proceeds partly from the Waters unequally cooling and preſſing the parts of the drop, and partly from the ſelf-contracting or ſubſiding quality of the ſubſtance of the Glaſs: For the vehemency of the heat of the drop cauſes ſuch ſudden motions and bubbles in the cold Water, that ſome parts of the Water bear more forcibly againſt one part then againſt another, and conſequently do more ſuddenly cool thoſe parts to which they are contiguous.

A Second Argument may be drawn from the Experiment of cutting Glaſſes with a hot Iron. For in that Experiment the top of the Iron heats, and thereby rarifies the parts of the Glaſs that lie juſt before the crack, whence each of thoſe agitated parts indeavouring to expand its ſelf and get elbow-room, thruſts off all the reſt of the contiguous parts, and conſequently promotes the crack that was before begun.

A Third Argument may be drawn from the way of producing a crack in a ſound piece or plate of Glaſs, which is done two wayes, either Firſt, by ſuddenly heating a piece of Glaſs in one place more then in another. And by this means *Chymiſts* uſually cut off the necks of Glaſs-bodies, by two kinds of Inſtruments, either by a glowing hot round Iron-Ring, which juſt incompaſſes the place that is to be cut, or elſe by a *Sulphur'd* Threed, which is often wound about the place where the ſeparation is to be made, and then fired. Or Secondly, A Glaſs may be cracked by cooling it ſuddenly in any place with Water, or the like, after it has been all leiſurely and gradually heated very hot. Both which *Phænomena* ſeem manifeſtly to proceed from the *expanſion* and contraction of the parts of the Glaſs, which is alſo made more probable by this circumſtance which I have obſerved, that a piece of common window-glaſs being heated in the middle very ſuddenly with a live Coal or hot Iron, does uſually at the firſt crack fall into pieces, whereas if the Plate has been gradually heated very hot, and a drop of cold Water and the like be put on the middle of it, it only flaws it, but does not break it aſunder immediately.

A Fourth Argument may be drawn from this Experiment; Take a Glaſs-pipe, and fit into it a ſolid ſtick of Glaſs, ſo as it will but juſt be moved in it. Then by degrees heat them whilſt they are one within another, and they will grow ſtiffer, but when they are again cold, they will be as eaſie to be turned as before. This Expanſion of Glaſs is more manifeſt in this Experiment.

Take a ſtick of Glaſs of a conſiderable length, and fit it ſo between the two ends or ſcrews of a Lath, that it may but juſt eaſily turn, and that the very ends of it may be juſt toucht and ſuſteined thereby; then applying the flame of the Candle to the middle of it, and heating it hot, you will preſently find the Glaſs to ſtick very faſt on thoſe points, and not without much difficulty to be convertible on them, before that by removing the flame for a while from it, it be ſuffered to cool, and then you will find it as eaſie to be turned round as at the firſt.

From all which Experiments it is very evident, that all thoſe Bodies, and particularly Glaſs, ſuffers an Expanſion by Heat, and that a very conſiderable

ſiderable one, whilſt they are in a ſtate of Fuſion. For *Fluidity*, as I elſewhere mention, *being nothing but an effect of a very ſtrong and quick ſhaking motion, whereby the parts are, as it were, looſened from each other, and conſequently leave an interjacent ſpace or vacuity*; it follows, that all thoſe ſhaken Particles muſt neceſſarily take up much more room then when they were at reſt, and lay quietly upon each other. And this is further confirmed by a Pot of *boyling Alabaſter*, which will manifeſtly riſe a ſixth or eighth part higher in the Pot, whilſt it is boyling, then it will remain at, both before and after it be boyled. The reaſon of which odd *Phænomenon* (to hint it here only by the way) is this, that there is in the curious powder of Alabaſter, and other calcining Stones, a certain watery ſubſtance, which is ſo fixt and included with the ſolid Particles, that till the heat be very conſiderable they will not fly away; but after the heat is increaſed to ſuch a degree, they break out every way in vapours, and thereby ſo ſhake and looſen the ſmall corpuſles of the Powder from each other, that they become perfectly of the nature of a fluid body, and one may move a ſtick to and fro through it, and ſtir it as eaſily as water, and the vapours burſt and break out in bubbles juſt as in boyling water, and the like; whereas, both before thoſe watery parts are flying away, and after they are quite gone; that is, before and after it have done boyling, all thoſe effects ceaſe, and a ſtick is as difficultly moved to and fro in it as in ſand, or the like. Which Explication I could eaſily prove, had I time; but this is not a fit place for it.

To proceed therefore, I ſay, that the dropping of this expanded Body into cold Water, does make the parts of the Glaſs ſuffer a double contraction: The firſt is, of thoſe parts which are neer the Surface of the Drop. For Cold, as I ſaid before, contracting Bodies, that is, *by the abatement of the agitating faculty the parts falling neerer together*; the parts next adjoying to the Water muſt needs loſe much of their motion, and impart it to the Ambient-water (which the Ebullition and commotion of it manifeſts) and thereby become a ſolid and hard cruſt, whilſt the innermoſt parts remain yet fluid and expanded; whence, as they grow cold alſo by degrees, their parts muſt neceſſarily be left at liberty to be condenſed, but becauſe of the hardneſs of the outward cruſt, the contraction cannot be admitted that way; but there being many very ſmall, and before inconſpicuous, bubbles in the ſubſtance of the Glaſs, upon the ſubſiding of the parts of the Glaſs, the agil ſubſtance contained in them has liberty of expanding it ſelf a little, and thereby thoſe bubbles grow much bigger, which is the ſecond Contraction. And both theſe are confirmed from the appearance of the Drop it ſelf: for as for the outward parts, we ſee, firſt, that it is irregular and ſhrunk, as it were, which is cauſed by the yielding a little of the hardened Skin to a Contraction, after the very outmoſt Surface is ſettled; and as for the internal parts, one may with ones naked Eye perceive abundance of very conſpicuous bubbles, and with the *Microſcope* many more.

The Conſideration of which Particulars will eaſily make the Third Poſition probable, that is, that the parts of the drop will be of a very hard, though of a rarified Texture; for if the outward parts of the Drop, by reaſon of its hard cruſt, will indure very little Contraction, and the agil Particles, inclu-